

ENERGY EFFICIENCY DESIGN INDEX (EEDI) MARPOL ANNEX VI: LEGAL FRAMEWORK AND REGULATORY PROBLEMS

Jaime Rodrigo de Larrucea. Prof. Maritime Law.
Technical University of Catalonia (UPC-Barcelona Tech)

ABSTRACT:

The present study wants to be a legal perspective, analyses of the main legal instruments on climate change in shipping (MARPOL ANNEX VI). Since this approach deepens the main technical work of the MEPC (*Energy Efficiency Design Index (EEDI)*; *Ship Energy Efficiency Management Plan (SEEMP)* and the EU proposals. The difficulties and potential effects on the market are also analyzed. In the field of maritime transport, essentially international, is more effective always universal application of the regulations. From this conviction it is examined the process of legal harmonization and proposes alternative dispute resolution criteria.

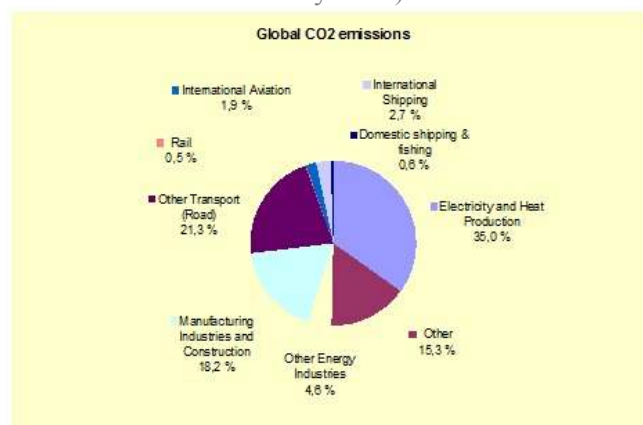
KEYWORDS:

MARPOL ANNEX VI, Energy Efficiency Design Index (EEDI), Ship Energy Efficiency Management Plan (SEEMP); Market Based Measures (MBM's).

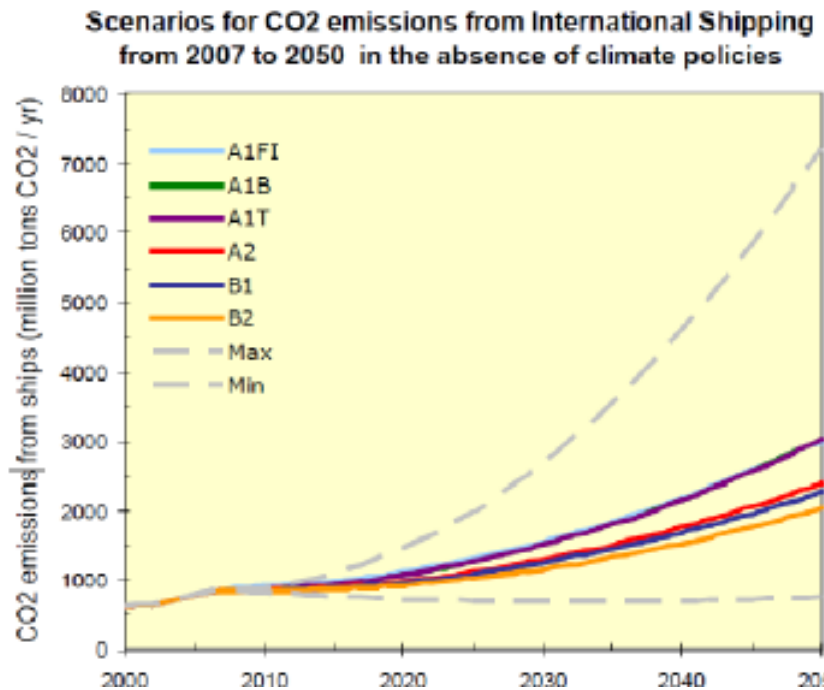
INTRODUCTION

As we already know, shipping is vital for the modern economy, being responsible for transporting 90% of world trade, but at the same time and contrary to what one might think, this is an environment-friendly transport, which emitted only 3,3% of global CO2 emissions in 2007. Although it

Source: Global emissions of CO2 in 2007 (Second IMO GHG Study 2009)



Source: Second IMO GHG Study 2009



is an industry, which emits a low amount of contamination compared to other transports industries; the activity in the Shipping sector has growth average by 5% per year. Obviously the growth in international maritime transport has also resulted in increased air emission, and for that reason, it is trying everyday to improve its

energy efficiency and reducing green house gases (GHG) from shipping.

Nevertheless as the International Maritime Organization (IMO), says in its Second IMO GHG Study 2009, “by year 2050, in the absence of policies, ship emissions could grow by 200 to 300% (compared to the emissions in 2007) as a result of the growth in world trade”.

IMO’S WORKS

This work has as starting point The United Nations Framework Convention on Climate Change (UNFCCC), aiming at stabilizing GHG in atmosphere, and in The Kyoto Protocol to UNFCCC (December 1997), that since this moment has been the main initiative in the fight against climate change, which in its Article 2.2 provides that: “*The Parties included in Annex I shall pursue limitation or reduction of emission of greenhouse gases from aviation and maritime bunker fuels, working through the International Civil Aviation organization and the International Maritime organization, respectively*”.

In this context, the IMO is responsible for global regulation relating to all aspects of International Shipping, and in this sense for studying the environmental aspects associated with this industry in order to reduce pollution from ships. Thus, the organization adopted in 1973 the already known MARPOL (International Convention for the Prevention of Pollution From Ships).

With regard to the Prevention of air pollution, the organization began its work in late 1980s. In 1997, a Protocol to MARPOL Annex VI, Regulations for the Prevention of Air Pollution from Ships was approved, and came into force on May 19, 2005.

In the area of reducing GHG emitted by vessels, the work of this agency has followed the Assembly resolution A.963 (23), which was adopted in December 2003. In this resolution A.963 (23), the IMO Assembly urged Marine Environment Protection Committee (MEPC) to identify and create the mechanisms needed to achieve limitation or reduction of emissions of GHG from international shipping. He urged the MEPC, in developing the necessary mechanisms give priority to the evaluation of technical, operational and market.

After several papers on the subject, recently at the MEPC 62, held in July 2011, a series of amendments to Annex VI were approved. These amendments added a new chapter 4 to Annex VI on Regulations on energy efficiency for ships to make mandatory the Energy Efficiency Design Index (EEDI) for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships. This work has great importance because it is considered the first mandatory global GHG reduction regime for an international industry sector. The regulations will come into force on 1 January 2013, after being accepted on July the 1st 2012.

Let's have a brief look at the objectives and the legal aspects of the methods introduced by these amendments:

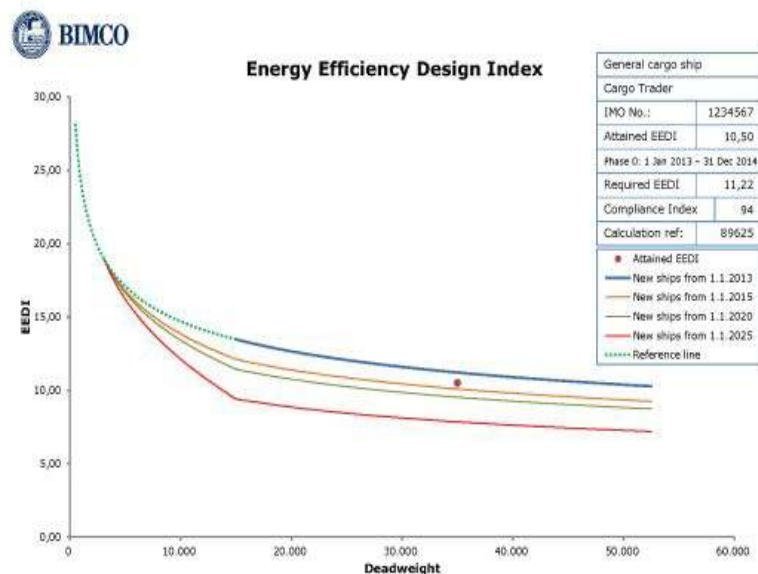
1) Energy Efficiency Design Index

The EEDI is an instrument provided for new ships that aims to reduce pollution through the development of energy efficient equipment and engines. Thus, it will serve as a mandatory fuel-efficiency tool at the design stage, requiring meeting a minimum level of fuel efficiency.

The aim is to have a staggered implementation, thus that technological development will be in keeping with the efficiency index, which will have an influence on the fuel efficiency of a ship from its design phase. The objective is to reduce 30% of emissions by 2030, from a baseline average of ships built in the last decade.

The EEDI will enter in force, firstly to those ships of 400 gross tonnage and above, for which the building contract is placed on or after January the 1st2013, secondly for those which in absence of a building contract, the keel of which is laid of which is at a similar stage of construction on or after July the 1st2013, and finally for those which delivery will be on or after July the 1st2015.

Source: BIMCO Reflections 2012



Nevertheless, it is possible that the different Administrations may waive this requirement but not in accordance to ships for which building contract is placed on or after January the 1st2017, or in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after July the 1st 2017, or the delivery of which is on or after July the 1st2019, or major conversion on or after January the 1st2017.

Despite the fact that several countries have opposed to the implementation of measures within the time allowed by the IMO, getting delays in implementation, some International Associations have clearly positioned against those delays.

Thus the Boards of Directors of The International Chamber of Shipping, in their meeting on September 13th 2011 expressed the following on EEDI waiver: *“With respect to the adoption of the IMO Energy Efficiency Design Index (EEDI), the ICS Board considered the theoretical right of flag States to issue waivers to ship-owners taking delivery of new ships, which had been agreed by IMO for political reasons in order to allay concerns amongst developing nations. The ICS Board concluded that no responsible ship-owner would want to order a new ship (that was covered by the new IMO regulation) without an EEDI, since this would almost certainly impact on in its ability to trade”*.

In the same way BIMCO’s Marine Committee has pronounced in its 22nd meeting in October 2011, expressing the following: *“BIMCO has evaluated the commercial implication of new ships built after 1 January 2013 being granted waivers from the*

Flag State for compliance with the EEDI requirement. It is BIMCO's firm recommendation that due to the lifespan of ships and the significant uncertainties in respect of governments' environmental agendas and how these may be applied, members should abstain from building new ships without certified EEDI compliance. Such ships would be compromised in relation to their future second-hand value in the market, potentially restricted in their ability to trade worldwide and be less attractive in the charter market due to their perceived lower efficiency" and also has emphasized that "their advice against waiver in no way bears a political signal. On the contrary, it is purely an acknowledgment of shipping being a global business and in line with BIMCO's objectives to promote fair business practices, free trade and open access to markets".

The ships which this measure will apply are the followings: Bulk Carriers, Gas Carriers, Tankers, Container ships, General Cargo ships, Refrigerated Cargo ships and Combination carriers, and it won't be applied for Offshore, Fishing and service vessels, Turbine ships and electric ships, Ro-Ro ships, Passenger ships, and ships solely engaged in voyages within the water of the flag state.

As we have seen, it is applied to the larger emitters, and for the rest, other formulas are expected to be developed in the future.

The EEDI is calculated by a formula based on technical design parameters, and provides, expressed in grams of CO₂ per ship's capacity-mile, specific figure for an individual ship design.

The formula used for calculating the EEDI is the following:

Source: International Council on Clean Transportation

$$\frac{\left(\prod_{j=1}^M f_j \right) \left(\sum_{i=1}^{nPE} P_{PEi} \cdot C_{EEDI} \cdot SFC_{EEDI} \right) + (P_A \cdot C_{EEDI} \cdot SFC_{EEDI}) + \left(\prod_{j=1}^M f_j \cdot \sum_{i=1}^{nPG} P_{PGi} \cdot \sum_{k=1}^{nMG} (f_{MGk} + B_{MGk}) \cdot C_{EEDI} \cdot SFC_{EEDI} \right) - \sum_{i=1}^{nET} f_{ETi} \cdot B_{ETi} \cdot C_{EEDI} \cdot SFC_{EEDI}}{f_0 \cdot Capacity \cdot V_{ref} \cdot f_0}$$

TRANSPORT WORK

That can be illustrated by the following simplified formula:

$$EEDI = \frac{CO_2 \text{ emission}}{\text{transport work}}$$

If you are interested in calculating the EEDI you can download the calculator that BIMCO (Baltic and International Maritime Council), offers at the address: <https://www.bimco.org/en/Products/EEDI.aspx>

2) Ship Energy Efficiency Management Plan

The EEMP for new and existing ships sets out best practices for the fuel efficient operation of ships as well as guidelines for the voluntary use of the Ship Energy Efficiency Operational Indicator (EEOI) for new and existing ships which enables operators to measure the fuel efficiency in grams of CO₂ per tone mile of a ship. This measure urges the ship owner and operator at each stage of the operation of the ship to review and consider operational practices and technology upgrades to optimize the energy efficiency performance of a ship.

More recently the MEPC 63, held in February- March 2012, has adopted four sets of guidelines intended to assist in the uniform implementation of the EEDI and SEEMP.

The four adopted guidelines are the followings:

- Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships.
- Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP).
- Guidelines on survey and certification of the Energy Efficiency Design Index (EED).
- Guidelines for calculation of reference lines for use with the Energy Efficiency Design Index (EEDI).

In the MEPC 63 it was also examined no less than ten different market-based measures (MBM's) of reducing GHG emissions and it could agree on none of them. It has a postponed deliberation of these until its next meeting in October. This MBM's are the followings:

- 1) An International Fund for Greenhouse Gases emissions from ships (GHG Fund) proposed by Cyprus, Denmark, the Marshall Islands, Nigeria and IPTA (MEPC 60/4/8).
- 2) Leveraged Incentive Scheme (LIS) to improve the energy efficiency of ships based on the International GHG Fund proposed by Japan (MEPC 60/4/37).
- 3) Achieving reduction in greenhouse gases emissions from ships through Port State arrangements utilizing the ship traffic, energy and environment model, STEEM (PSL) proposal by Jamaica (MEPC 60/4/40).
- 4) The United States proposal to reduce greenhouse gases emissions from international shipping, the Ship Efficiency and Credit Trading (SECT) (MEPC 60/4/12)
- 5) Vessel Efficiency System (VES) proposal by World Shipping Council (MEPC 60/4/39)
- 6) Global Emission Trading Scheme System (ETS) for international shipping proposal by Norway (MEPC 60/4/22)
- 7) Global Emissions Trading System (ETS) for international shipping proposal by the United Kingdom (MEPC 60/4/26)
- 8) Further elements for the development of an Emissions Trading System (ETS) for International Shipping proposal by France (MEPC 60/4/41)
- 9) Market-Based Instruments: a penalty on trade and development proposal by the Bahamas (MEPC 60/4/10)
- 10) A Rebate Mechanism (RM) for a market-based instrument for international shipping proposal by IUCN (MEPC 60/4/55)

THE EU PROPOSALS

The EU has committed itself to reduce CO₂ emissions by at least 20% by 2020, in this sense, in its Directive 2009/29/EC of the European Parliament and of the Council, of April 23rd 2009, amending the Directive 2003/87/EC so as to improve and extend the greenhouse gases emission allowance trading scheme of the Community, established that: *“In the event that no international agreement which includes international maritime emissions in its reduction targets through the International Maritime Organization has been approved by the Member States or no such agreement through the UNFCCC has been approved by the Community by 31 December 2011, the Commission should make a proposal to include international maritime emissions according to harmonized modalities in the Community reduction commitment, with the aim of the proposed act entering into force by 2013”*.

After the adaptation of the new mechanisms by the IMO the Climate Action Commissioner Connie Hedegaard said: *"This is a very positive and important first step for a truly global, binding measure to reduce CO₂ emissions. I am glad that it covers new ships and such a large segment of the world merchant fleet. I also hope this momentum will help the ongoing debate on further reducing emissions from*

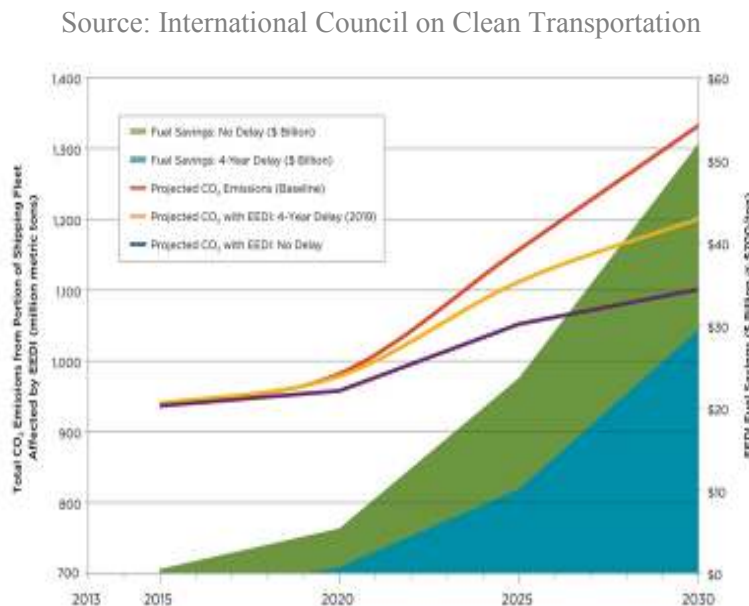
international maritime transport. Europe remains fully committed to keep addressing this issue at all levels and international fora".

Recently, despite the works of The IMO, and even the congratulation of the European Commission to the IMO, the EU has said that *"there has been only limited progress to date on the necessary technical, operational and market-based measures for new and existing ships"*, it is insufficient to arrived to what the EU has committed to, and for that reason in January this year, the European Commission launched an on-line consultation on possible measures to reduce greenhouse gases emissions from ships. All interested stakeholders could send their contribution until 12 April 2012, on four policy options, including a compensation fund, an emissions trading system, a fuel or carbon tax and a mandatory emission reduction per ship.

In this situation, and taking into account the ongoing frustration of the European Union, it is expected that the EU plans to include these emissions in the existing EU reduction commitment, with possible action later this year.

THE MARKET PRACTISES

The implementation of these measures to reduce greenhouse gases would not have to be expensive in the early stages to the owners, and even be offset by a significant decrease



in fuel consumption, although these savings require deep investments in more efficient vessels and more sophisticated technologies and new practices.

Fuel reserves will become scarcer in future decades, sourced increasingly from uncertain supplies. As the International Energy Agency (IEA) has recently pointed out,

"the less successful the world is in decarbonising, the greater will be the oil price increase".

This variation has a permanent reflection freight rates through the BAF (Bunker Adjustment Factor) and in this sense lower fuel consumption will affect the final price less freight.

CONCLUSIONS

The Shipping Business is growing day by day and for this reason we must implement measures to reduce atmospheric pollution from ships. As we have seen, IMO is working in this way and has created such an important measure that is the first mandatory global GHG reduction regime for an international industry sector.

The IMO has estimated that through the implementation of the EEDI and the SEEMP, by 2020 will reduce emissions by 180 million tons of CO₂ (assuming a reduction of between 9 and 16%), a figure that will increase to 390 million tons annually in 2030 (a figure that will be a 17 to 25% in contrast to the current market). IMO has also estimated that implementation of these measures will entail a significant annual fuel cost saving about \$ 50 billion in 2020 and \$200 in 2030.

Despite the fact that some countries have opposed to the measures, and have succeeded in the introduction of a waive option, some international organizations like BIMCO and ICS positioned against this possibility.

The market has well accepted this measure because at first time it will represent a cost but then it will be decrease in fuel consumption so this initially cost will be offset by this reduction.

In the other hand, the European Commission, albeit their declarations in working together in an international way, has declared that the work in the international way it is not sufficient and it is possible that it will work alone in this way.

However, due to the different criteria in sectors of the international community, all progress in this area depend on the future of negotiations to combat climate change

BIBLIOGRAPHY

- Bazari Zabi (Lloyd's Register). *Project Final Report. Assessment of IMO mandated energy efficiency measures for international shipping. Estimated CO₂ emissions reduction form introduction of mandatory technical and operational energy efficiency measures for ships*. 31 October 2011.

- *BIMCO Reflections 2012.*
- European Union. *White Paper; Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* (European Commission).
- European Union. Directive 2009/29/EC of the European Parliament and of the Council, of 23 April 2009, amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community.
- European Union. Resolution MEPC.203(62), Adopted on 15 July 2011, Amendments to the Annex of the Protocol of 1997 to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 .
- IMO. *Main events in IMO's work on limitation and reduction of greenhouse gas emissions from international shipping.* October 2011.
- International Council on Clean Transportation. *The Energy Efficiency Design Index (EEDI) for New Ships.* October 3, 2011.
- Koichi Yoshida. *Energy Efficiency Design Index (EEDI) MARPOL ANNEX VI and Marine Environment protection (Power point)*
- <http://imo.org> (International Maritime Organization).
- <http://www.iea.org> (International Energy Agency).
- www.theicct.org (International Council on Clean Transportation).
- http://ec.europa.eu/clima/policies/transport/shipping/index_en.htm.
- <http://www.bimco.org>.
- <http://marisec.org> (International Chamber of Shipping).
- www.emsa.europa.eu/ (European Maritime Safety Agency).